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EXAMINER	
LOO, JUVENA W	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/721,511	SAKSIO, MAURI	
	Examiner	Art Unit	
	JUVENA LOO	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *25 February 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) *6 and 15* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-5, 7-12, 14, and 16-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Saleh et al. (US 7,200,104 B2).

Saleh el al. discloses a method for restoring a virtual path, provisioned between a source and a target node comprising the features:

Regarding claim 1, *a method comprising*:

monitoring in an intermediate tree element the state of a critical up-link, the critical up-link being an only link from the intermediate tree element to an upper stage tree element in the tree structure (Saleh: see Figure 1, Primary Path VP0 and Secondary Path VP0; see also “In a 1 + 1 restoration method, two distinct physical paths…in case of a failure” in column 3, lines 64 through column 4, line 32; see also

"When the VP's active physical path fails at a tandem node, the tandem node initiates a path restoration request for the end nodes (the source node and the destination node) of the failed VP using a Restore_I request" in column 4, lines 47 – 50; for each virtual path (VP0), two disjoint physical paths, a primary and a secondary, are setup. Each intermediate or tandem node in the primary and secondary physical path has only one link connected to another node going toward the destination (up-link direction) and one link to another node toward the source (down-link direction). When the VP's active physical path fails at an intermediate node, the intermediate node detects the failure and initiates a path restoration request for the end (source and destination) nodes).

detecting, in the intermediate tree element, a link-down state in the critical up-link (Saleh: see "When the VP's active physical path fails at a tandem node, the tandem node initiates a path restoration request for the end nodes (the source node and the destination node) of the failed VP using a Restore_I request" in column 4, lines 47 – 50; when the VP's active physical path fails at an intermediate node, the intermediate node detects the failure and initiates a path restoration request for the end nodes); *and*

setting, in the intermediate tree element, a dependent down-link in a link-down state, if said critical up-link is detected to be in the link-down state, the dependent down-link leading to a lower stage tree element in the tree structure and being an only link from the intermediate tree element to the lower state tree element in the tree structure (Saleh: see Figure 1, Primary Path VP0 and Secondary Path VP0; see also "When the

VP's active physical path fails at a tandem node, the tandem node initiates a path restoration request for the end nodes (the source node and the destination node) of the failed VP using a Restore_I request" in column 4, lines 47 – 50; see also Figure 4 and "FIG. 4 is a flowchart illustrating the actions…VP at the tandem nodes are not released" in column 5, lines 42 - 61; for each virtual path (VP0), two disjoint physical paths, a primary and a secondary, are setup. Each intermediate or tandem node in the primary and secondary physical path has only one link connected to another node going toward the destination (up-link direction) and one link to another node toward the source (down-link direction). When the VP's active physical path fails at an intermediate node, the intermediate node detects the failure and initiates a path restoration request for the end nodes. In addition, when an intermediate node receives a notification of a VP failure, it forwards the failure notification along the path towards the end node).

wherein the redundant tree structured local area network comprises at least two separate subtrees ending to a set of same host devices, wherein each subtree comprises at least one intermediate stage and wherein an intermediate stage tree element of one tree is not directly connected to an intermediate stage tree element of another tree at the same stage (Saleh: see Figure 1, Primary Path VP0 and Secondary Path VP0; see also "In a 1 + 1 restoration method, two distinct physical paths…in case of a failure" in column 3, lines 64 through column 4, line 32; for each virtual path (VP0), two disjoint physical paths, a primary and a secondary, are setup. Each intermediate or tandem node in the primary and secondary physical path has only one link connected to

another node going toward the destination (up-link direction) and one link to another node toward the source (down-link direction)).

Regarding claim 2, *further comprising:*

specifying the up-link of a network element as a critical up-link, if the failure of said link affects the data flow of a down-link of said network element (Saleh: see Figure 1, Primary Path VP0 and Secondary Path VP0; see also "In a 1 + 1 restoration method, two distinct physical paths…in case of a failure" in column 3, lines 64 through column 4, line 32; see also "When the VP's active physical path fails at a tandem node…to reflect the physical path change of the VP" in column 4, lines 47 through column 5, line 9; see also Figure 4 and "FIG. 4 is a flowchart illustrating the actions…VP at the tandem nodes are not released" in column 5, lines 42 - 61; for each virtual path (VP0), two disjoint physical paths, a primary and a secondary, are setup. Each intermediate or tandem node in the primary and secondary physical path has only one link connected to another node going toward the destination (up-link direction) and one link to another node toward the source (down-link direction). When the VP's active physical path fails at an intermediate node, the intermediate node detects the failure and initiates a path restoration request for the end nodes. In addition, when an intermediate node receives a notification of a VP failure, it forwards the failure notification along the path towards the end nodes. When an end node receives a path failure message or a Restore_I request, the end node switches the VP to the standby path).

Regarding claim 3, *further comprising*:

specifying the link of a network element as a dependent down-link, if there is a critical up-link between said down-link and a next network element (Saleh: see Figure 1, Primary Path VP0 and Secondary Path VP0; see also "In a 1 + 1 restoration method, two distinct physical paths…in case of a failure" in column 3, lines 64 through column 4, line 32; see also "When the VP's active physical path fails at a tandem node…to reflect the physical path change of the VP" in column 4, lines 47 through column 5, line 9; see also Figure 4 and "FIG. 4 is a flowchart illustrating the actions…VP at the tandem nodes are not released" in column 5, lines 42 - 61; for each virtual path (VP0), two disjoint physical paths, a primary and a secondary, are setup. Each intermediate or tandem node in the primary and secondary physical path has only one link connected to another node going toward the destination (up-link direction) and one link to another node toward the source (down-link direction). When the VP's active physical path fails at an intermediate node, the intermediate node detects the failure and initiates a path restoration request for the end nodes. In addition, when an intermediate node receives a notification of a VP failure, it forwards the failure notification along the path towards the end nodes. When an end node receives a path failure message or a Restore_I request, the end node switches the VP to the standby path).

Regarding claim 4, *wherein the monitoring of the state of a critical up-link is accomplished by monitoring the quality of the data flow on the link* (Saleh: see "In case of a VP failure at any node in the network…to restore the failed VP").

Regarding claim 5, *a method comprising*:

monitoring, in a host device, the state of an active up-link in a host device leading to an intermediate tree element in a first tree (Saleh: see Figure 1, Primary Path VP0 and Secondary Path VP0; see also "In a 1 + 1 restoration method, two distinct physical paths…in case of a failure" in column 3, lines 64 through column 4, line 32; see also "When the VP's active physical path fails at a tandem node…to reflect the physical path change of the VP" in column 4, lines 47 through column 5, line 9; see also Figure 4 and "FIG. 4 is a flowchart illustrating the actions…VP at the tandem nodes are not released" in column 5, lines 42 - 61; for each virtual path (VP0), two disjoint physical paths, a primary and a secondary, are setup. Each intermediate or tandem node in the primary and secondary physical path has only one link connected to another node going toward the destination (up-link direction) and one link to another node toward the source (down-link direction). When the VP's active physical path fails at an intermediate node, the intermediate node detects the failure and initiates a path restoration request for the end nodes. In addition, when an intermediate node receives a notification of a VP failure, it forwards the failure notification along the path towards the end nodes. When an end node receives a path failure message or a Restore_I request, the end node switches the VP to the standby path); *and*

detecting, in the host device, a link-down state in the active up-link (Saleh: see "When the VP's active physical path fails at a tandem node…to reflect the physical path change of the VP" in column 4, lines 47 through column 5, line 9; see also Figure 4 and "FIG. 4 is a flowchart illustrating the actions…VP at the tandem nodes are not released" in column 5, lines 42 - 61; when the VP's active physical path fails at an intermediate node, the intermediate node detects it and initiates a path restoration request for the end (source and destination) nodes. In addition, when an intermediate node receives a notification of a VP failure, it forwards the failure notification along the path towards the end nodes. When an end node receives a path failure message or a Restore_I request, the end node switches the VP to the standby path),

notifying host software about the link-down state (Saleh: see "When the VP's active physical path fails at a tandem node…to reflect the physical path change of the VP" in column 4, lines 47 through column 5, line 9; see also Figure 4 and "FIG. 4 is a flowchart illustrating the actions…VP at the tandem nodes are not released" in column 5, lines 42 - 61; when the VP's active physical path fails at an intermediate node, the tandem node detects it and initiates a path restoration request for the end nodes. In addition, when an intermediate node receives a notification of a VP failure, it forwards the failure notification along the path towards the end nodes. When an end node receives a path failure message or a Restore_I request, the end node switches the VP to the standby path), *and*

starting a recovery process in the host device by changing the failed active up-link to a redundant up-link leading to an upper stage intermediate tree element in a

second tree (Saleh: see "When the VP's active physical path fails at a tandem node…to reflect the physical path change of the VP" in column 4, lines 47 through column 5, line 9; see also Figure 4 and "FIG. 4 is a flowchart illustrating the actions…VP at the tandem nodes are not released" in column 5, lines 42 - 61; for each virtual path (VP0), two disjoint physical paths, a primary and a secondary, are setup. Each intermediate or tandem node in the primary and secondary physical path has only one link connected to another node going toward the destination (up-link direction) and one link to another node toward the source (down-link direction). When the VP's active physical path fails at an intermediate node, the tandem node detects it and initiates a path restoration request for the end nodes. In addition, when an intermediate node receives a notification of a VP failure, it forwards the failure notification along the path towards the end nodes. When an end node receives a path failure message or a Restore_I request, the end node switches the VP to the standby path),

wherein the redundant tree structured local area network comprises at least two separate subtrees ending to a set of same host devices, wherein each subtree comprises at least one intermediate stage and wherein an intermediate stage tree element of one tree is not directly connected to an intermediate stage tree element of another tree at the same stage (Saleh: see Figure 1, Primary Path VP0 and Secondary Path VP0; see also "In a 1 + 1 restoration method, two distinct physical paths…in case of a failure" in column 3, lines 64 through column 4, line 32; for each virtual path (VP0), two disjoint physical paths, a primary and a secondary, are setup. Each intermediate or tandem node in the primary and secondary physical path has only one link connected to

another node going toward the destination (up-link direction) and one link to another node toward the source (down-link direction)).

Regarding claim 7, *wherein the recovery process comprises:*

checking the status of a redundant up-link (Saleh: see Figure 4 and “If the failure notification is received by the end node…the previous physical path is restored” in column 5, line 62 through column 6, line 21)*, and*

if said up-link is in the link down state, and transferring said host to a predetermined default mode operation (Saleh: see Figure 4 and “If the failure notification is received by the end node…the previous physical path is restored” in column 5, line 62 through column 6, line 21).

Regarding claim 8, *wherein the redundant up-link is a doubling up-link for the active up-link* (Saleh: see Figure 1, Primary Path VP0 and Secondary Path VP0; see also “In a 1 + 1 restoration method, two distinct physical paths…in case of a failure” in column 3, lines 64 through column 4, line 32; for each virtual path (VP0), two disjoint physical paths, a primary and a secondary, are setup. Each intermediate or tandem node in the primary and secondary physical path has only one link connected to another node going toward the destination (up-link direction) and one link to another node toward the source (down-link direction)).

Regarding claim 9, *an apparatus* (Saleh: see Figure 1)*, comprising*:

a controller (Saleh: see "the present invention…standby physical path" in column 2, line 15 – 23) *configured to*

monitor the state of a critical up-link, the critical up-link being an only link to an upper stage tree element in the tree structure of a redundant tree structured local area network comprising at least two separate subtrees ending to a set of same host devices (Saleh: see Figure 1, Primary Path VP0 and Secondary Path VP0; see also "In a 1 + 1 restoration method, two distinct physical paths…in case of a failure" in column 3, lines 64 through column 4, line 32; see also see "When the VP's active physical path fails at a tandem node…to reflect the physical path change of the VP" in column 4, lines 47 through column 5, line 9; see also Figure 4 and "FIG. 4 is a flowchart illustrating the actions…VP at the tandem nodes are not released" in column 5, lines 42 - 61; for each virtual path (VP0), two disjoint physical paths, a primary and a secondary, are setup. Each intermediate or tandem node in the primary and secondary physical path has only one link connected to another node going toward the destination (up-link direction) and one link to another node toward the source (down-link direction). When the VP's active physical path fails at an intermediate node, the tandem node detects it and initiates a path restoration request for the end nodes. In addition, when an intermediate node receives a notification of a VP failure, it forwards the failure notification along the path towards the end nodes. When an end node receives a path failure message or a Restore_I request, the end node switches the VP to the secondary path),

wherein each subtree comprises to at least one intermediate stage and wherein an intermediate stage tree element of one tree is not directly connected to an

intermediate stage tree element of another tree at the same stage (Saleh: see Figure 1, Primary Path VP0 and Secondary Path VP0; see also “In a 1 + 1 restoration method, two distinct physical paths…in case of a failure” in column 3, lines 64 through column 4, line 32; for each virtual path (VP0), two disjoint physical paths, a primary and a secondary, are setup. Each intermediate or tandem node in the primary and secondary physical path has only one link connected to another node going toward the destination (up-link direction) and one link to another node toward the source (down-link direction)),

detect a link-down state in the critical up-link (Saleh: see “When the VP’s active physical path fails at a tandem node, the tandem node initiates a path restoration request for the end nodes (the source node and the destination node) of the failed VP using a Restore_I request” in column 4, lines 47 – 50; when the VP’s active physical path fails at an intermediate node, the intermediate node detects the failure and initiates a path restoration request for the end nodes), *and*

set a dependent down-link in a link-down state, the dependent down-link leading to a lower stage tree element in the tree structure and being an only link to the lower stage tree element in the tree structure (Saleh: see Figure 1, Primary Path VP0 and Secondary Path VP0; see also “When the VP’s active physical path fails at a tandem node, the tandem node initiates a path restoration request for the end nodes (the source node and the destination node) of the failed VP using a Restore_I request” in column 4, lines 47 – 50; see also Figure 4 and “FIG. 4 is a flowchart illustrating the actions…VP at the tandem nodes are not released” in column 5, lines 42 - 61; for each virtual path (VP0), two disjoint physical paths, a primary and a secondary, are setup. Each

intermediate or tandem node in the primary and secondary physical path has only one link connected to another node going toward the destination (up-link direction) and one link to another node toward the source (down-link direction). When the VP's active physical path fails at an intermediate node, the intermediate node detects the failure and initiates a path restoration request for the end nodes. In addition, when an intermediate node receives a notification of a VP failure, it forwards the failure notification along the path towards the end node).

Regarding claim 10, *comprising*:

a physical layer configured to monitor the physical state of said up-link devices (Saleh: see Figure 1, Primary Path VP0 and Secondary Path VP0; see also "In a 1 + 1 restoration method, two distinct physical paths…in case of a failure" in column 3, lines 64 through column 4, line 32; see also see "When the VP's active physical path fails at a tandem node…to reflect the physical path change of the VP" in column 4, lines 47 through column 5, line 9; see also Figure 4 and "FIG. 4 is a flowchart illustrating the actions…VP at the tandem nodes are not released" in column 5, lines 42 - 61; for each virtual path (VP0), two disjoint physical paths, a primary and a secondary, are setup. Each intermediate or tandem node in the primary and secondary physical path has only one link connected to another node going toward the destination (up-link direction) and one link to another node toward the source (down-link direction). When the VP's active physical path fails at an intermediate node, the tandem node detects it and initiates a path restoration request for the end nodes. In addition, when an intermediate node

receives a notification of a VP failure, it forwards the failure notification along the path towards the end nodes. When an end node receives a path failure message or a Restore_I request, the end node switches the VP to the secondary path); *and*

a media access controller configured to change the state of the down-link (Saleh: see Figure 1, Primary Path VP0 and Secondary Path VP0; see also "When the VP's active physical path fails at a tandem node, the tandem node initiates a path restoration request for the end nodes (the source node and the destination node) of the failed VP using a Restore_I request" in column 4, lines 47 – 50; see also Figure 4 and "FIG. 4 is a flowchart illustrating the actions…VP at the tandem nodes are not released" in column 5, lines 42 - 61; for each virtual path (VP0), two disjoint physical paths, a primary and a secondary, are setup. Each intermediate or tandem node in the primary and secondary physical path has only one link connected to another node going toward the destination (up-link direction) and one link to another node toward the source (down-link direction). When the VP's active physical path fails at an intermediate node, the intermediate node detects the failure and initiates a path restoration request for the end nodes. In addition, when an intermediate node receives a notification of a VP failure, it forwards the failure notification along the path towards the end node).

Regarding claim 11, *wherein the up-link of the apparatus is a critical up-link, if the failure of said link affects the data flow of a down-link of said apparatus* (Saleh: see Figure 1, Primary Path VP0 and Secondary Path VP0; see also "In a 1 + 1 restoration method, two distinct physical paths…in case of a failure" in column 3, lines 64 through

column 4, line 32; see also “When the VP’s active physical path fails at a tandem node…to reflect the physical path change of the VP” in column 4, lines 47 through column 5, line 9; see also Figure 4 and “FIG. 4 is a flowchart illustrating the actions…VP at the tandem nodes are not released” in column 5, lines 42 - 61; for each virtual path (VP0), two disjoint physical paths, a primary and a secondary, are setup. Each intermediate or tandem node in the primary and secondary physical path has only one link connected to another node going toward the destination (up-link direction) and one link to another node toward the source (down-link direction). When the VP’s active physical path fails at an intermediate node, the intermediate node detects the failure and initiates a path restoration request for the end nodes. In addition, when an intermediate node receives a notification of a VP failure, it forwards the failure notification along the path towards the end nodes. When an end node receives a path failure message or a Restore_I request, the end node switches the VP to the standby path).

Regarding claim 12, *wherein link of the apparatus is a dependent down-link, if there is a critical up-link between said down-link and a next network element* (Saleh: see Figure 1, Primary Path VP0 and Secondary Path VP0; see also “In a 1 + 1 restoration method, two distinct physical paths…in case of a failure” in column 3, lines 64 through column 4, line 32; see also “When the VP’s active physical path fails at a tandem node…to reflect the physical path change of the VP” in column 4, lines 47 through column 5, line 9; see also Figure 4 and “FIG. 4 is a flowchart illustrating the

actions…VP at the tandem nodes are not released" in column 5, lines 42 - 61; for each virtual path (VP0), two disjoint physical paths, a primary and a secondary, are setup. Each intermediate or tandem node in the primary and secondary physical path has only one link connected to another node going toward the destination (up-link direction) and one link to another node toward the source (down-link direction). When the VP's active physical path fails at an intermediate node, the intermediate node detects the failure and initiates a path restoration request for the end nodes. In addition, when an intermediate node receives a notification of a VP failure, it forwards the failure notification along the path towards the end nodes. When an end node receives a path failure message or a Restore_I request, the end node switches the VP to the standby path).

Regarding claim 14, *comprising*:

a controller (Saleh: see "the present invention…standby physical path" in column 2, line 15 – 23) *configured to*

monitor the state of an active up-link, leading to an intermediate tree element in a first tree of a redundant tree structured local area network comprising at least two separate subtrees ending to a set of same host devices, wherein each subtree comprises at least one intermediate stage and wherein an intermediate stage tree element of one tree is not directly connected to an intermediate stage tree element of another tree at the same stage (Saleh: see Figure 1, Primary Path VP0 and Secondary Path VP0; see also "In a 1 + 1 restoration method, two distinct physical paths…in case

of a failure” in column 3, lines 64 through column 4, line 32; see also “When the VP’s active physical path fails at a tandem node…to reflect the physical path change of the VP” in column 4, lines 47 through column 5, line 9; see also Figure 4 and “FIG. 4 is a flowchart illustrating the actions…VP at the tandem nodes are not released” in column 5, lines 42 - 61; for each virtual path (VP0), two disjoint physical paths, a primary and a secondary, are setup. Each intermediate or tandem node in the primary and secondary physical path has only one link connected to another node going toward the destination (up-link direction) and one link to another node toward the source (down-link direction). When the VP’s active physical path fails at an intermediate node, the intermediate node detects the failure and initiates a path restoration request for the end nodes. In addition, when an intermediate node receives a notification of a VP failure, it forwards the failure notification along the path towards the end nodes. When an end node receives a path failure message or a Restore_I request, the end node switches the VP to the standby path).

detect a link-down state in the active up-link (Saleh: see “When the VP’s active physical path fails at a tandem node…to reflect the physical path change of the VP” in column 4, lines 47 through column 5, line 9; see also Figure 4 and “FIG. 4 is a flowchart illustrating the actions…VP at the tandem nodes are not released” in column 5, lines 42 - 61; when the VP’s active physical path fails at an intermediate node, the intermediate node detects it and initiates a path restoration request for the end (source and destination) nodes. In addition, when an intermediate node receives a notification of a VP failure, it forwards the failure notification along the path towards the end nodes.

When an end node receives a path failure message or a Restore_I request, the end node switches the VP to the standby path),

notify host software about the link-down state (Saleh: see "When the VP's active physical path fails at a tandem node…to reflect the physical path change of the VP" in column 4, lines 47 through column 5, line 9; see also Figure 4 and "FIG. 4 is a flowchart illustrating the actions…VP at the tandem nodes are not released" in column 5, lines 42 - 61; when the VP's active physical path fails at an intermediate node, the tandem node detects it and initiates a path restoration request for the end nodes. In addition, when an intermediate node receives a notification of a VP failure, it forwards the failure notification along the path towards the end nodes. When an end node receives a path failure message or a Restore_I request, the end node switches the VP to the standby path)*, and*

start a recovery process by changing the failed active up-link to a redundant up-link leading to an upper stage intermediate tree element in a second tree (Saleh: see "When the VP's active physical path fails at a tandem node…to reflect the physical path change of the VP" in column 4, lines 47 through column 5, line 9; see also Figure 4 and "FIG. 4 is a flowchart illustrating the actions…VP at the tandem nodes are not released" in column 5, lines 42 - 61; for each virtual path (VP0), two disjoint physical paths, a primary and a secondary, are setup. Each intermediate or tandem node in the primary and secondary physical path has only one link connected to another node going toward the destination (up-link direction) and one link to another node toward the source (down-link direction). When the VP's active physical path fails at an intermediate node, the

tandem node detects it and initiates a path restoration request for the end nodes. In addition, when an intermediate node receives a notification of a VP failure, it forwards the failure notification along the path towards the end nodes. When an end node receives a path failure message or a Restore_I request, the end node switches the VP to the standby path).

Regarding claim 16, *an apparatus* (Saleh: see Figure 1), *comprising*:

monitoring means for monitoring the state of a critical up-link, the critical up-link being an only link to an upper stage tree element in the tree structure of a redundant tree structured local area network comprising at least two separate subtrees ending to a set of same host devices, wherein each subtree comprises at least one intermediate stage and wherein an intermediate stage tree element of one tree is not directly connected to an intermediate stage tree element of another tree at the same stage (Saleh: see Figure 1, Primary Path VP0 and Secondary Path VP0 ; see also “In a 1 + 1 restoration method, two distinct physical paths…in case of a failure” in column 3, lines 64 through column 4, line 32; see also “When the VP’s active physical path fails at a tandem node, the tandem node initiates a path restoration request for the end nodes (the source node and the destination node) of the failed VP using a Restore_I request” in column 4, lines 47 – 50; for each virtual path (VP0), two disjoint physical paths, a primary and a secondary, are setup. Each intermediate or tandem node in the primary and secondary physical path has only one link connected to another node going toward the destination (up-link direction) and one link to another node toward the source (down-

link direction). When the VP's active physical path fails at an intermediate node, the intermediate node detects the failure and initiates a path restoration request for the end nodes);

detecting means for detecting a link-down state in the critical up-link (Saleh: see "When the VP's active physical path fails at a tandem node, the tandem node initiates a path restoration request for the end nodes (the source node and the destination node) of the failed VP using a Restore_I request" in column 4, lines 47 – 50; for each virtual path (VP0), two disjoint physical paths, a primary and a secondary, are setup. Each intermediate or tandem node in the primary and secondary physical path has only one link connected to another node going toward the destination (up-link direction) and one link to another node toward the source (down-link direction). When the VP's active physical path fails at an intermediate node, the intermediate node detects it and initiates a path restoration request for the end nodes); *and*

setting means for setting a dependent down-link in a link-down state, the dependent down-link leading to a lower stage tree element in the tree structure and being an only link to the lower stage tree element in the tree structure (Saleh: see Figure 1, Primary Path VP0 and Secondary Path VP0; see also "When the VP's active physical path fails at a tandem node, the tandem node initiates a path restoration request for the end nodes (the source node and the destination node) of the failed VP using a Restore_I request" in column 4, lines 47 – 50; see also Figure 4 and "FIG. 4 is a flowchart illustrating the actions…VP at the tandem nodes are not released" in column 5, lines 42 - 61; for each virtual path (VP0), two disjoint physical paths, a primary and a

secondary, are setup. Each intermediate or tandem node in the primary and secondary physical path has only one link connected to another node going toward the destination (up-link direction) and one link to another node toward the source (down-link direction). When the VP's active physical path fails at an intermediate node, the intermediate node detects the failure and initiates a path restoration request for the end nodes. In addition, when an intermediate node receives a notification of a VP failure, it forwards the failure notification along the path towards the end node).

Regarding claim 17, an apparatus, comprising:

monitoring means for monitoring the state of an active up-link leading to an intermediate tree element in a first tree of a redundant tree structured local area network comprising at least two separate subtrees ending to a set of same host devices, wherein each subtree comprises at least one intermediate stage and wherein an intermediate stage tree element of one tree is not directly connected to an intermediate stage tree element of another tree at the same stage (Saleh: see Figure 1, Primary Path VP0 and Secondary Path VP0; see also "In a 1 + 1 restoration method, two distinct physical paths…in case of a failure" in column 3, lines 64 through column 4, line 32; see also "When the VP's active physical path fails at a tandem node…to reflect the physical path change of the VP" in column 4, lines 47 through column 5, line 9; see also Figure 4 and "FIG. 4 is a flowchart illustrating the actions…VP at the tandem nodes are not released" in column 5, lines 42 - 61; for each virtual path (VP0), two disjoint physical paths, a primary and a secondary, are setup. Each intermediate or tandem node in the

primary and secondary physical path has only one link connected to another node going toward the destination (up-link direction) and one link to another node toward the source (down-link direction). When the VP's active physical path fails at an intermediate node, the intermediate node detects the failure and initiates a path restoration request for the end nodes. In addition, when an intermediate node receives a notification of a VP failure, it forwards the failure notification along the path towards the end nodes. When an end node receives a path failure message or a Restore_I request, the end node switches the VP to the standby path); *and*

detecting means for detecting a link-down state in the active up-link (Saleh: see "When the VP's active physical path fails at a tandem node…to reflect the physical path change of the VP" in column 4, lines 47 through column 5, line 9; see also Figure 4 and "FIG. 4 is a flowchart illustrating the actions…VP at the tandem nodes are not released" in column 5, lines 42 - 61; when the VP's active physical path fails at an intermediate node, the intermediate node detects it and initiates a path restoration request for the end (source and destination) nodes. In addition, when an intermediate node receives a notification of a VP failure, it forwards the failure notification along the path towards the end nodes. When an end node receives a path failure message or a Restore_I request, the end node switch the VP to the standby path);

notifying means for notifying host software about the link-down state (Saleh: see "When the VP's active physical path fails at a tandem node…to reflect the physical path change of the VP" in column 4, lines 47 through column 5, line 9; see also Figure 4 and "FIG. 4 is a flowchart illustrating the actions…VP at the tandem nodes are not released"

in column 5, lines 42 - 61; when the VP's active physical path fails at an intermediate node, the tandem node detects it and initiates a path restoration request for the end nodes. In addition, when an intermediate node receives a notification of a VP failure, it forwards the failure notification along the path towards the end nodes. When an end node receives a path failure message or a Restore_I request, the end node switch the VP to the standby path); *and*

starting means for starting a recovery process by changing the failed active up-link to a redundant up-link leading to an upper stage intermediate tree element in a second tree if said active link is in the link down state (Saleh: see "When the VP's active physical path fails at a tandem node…to reflect the physical path change of the VP" in column 4, lines 47 through column 5, line 9; see also Figure 4 and "FIG. 4 is a flowchart illustrating the actions…VP at the tandem nodes are not released" in column 5, lines 42 - 61; for each virtual path (VP0), two disjoint physical paths, a primary and a secondary, are setup. Each intermediate or tandem node in the primary and secondary physical path has only one link connected to another node going toward the destination (up-link direction) and one link to another node toward the source (down-link direction). When the VP's active physical path fails at an intermediate node, the tandem node detects it and initiates a path restoration request for the end nodes. In addition, when an intermediate node receives a notification of a VP failure, it forwards the failure notification along the path towards the end nodes. When an end node receives a path failure message or a Restore_I request, the end node switches the VP to the standby path).

Regarding claim 18, *a system* (Saleh: see Figure 1) *comprising*:

a redundant tree structured local area net-work comprising at least two separate subtrees ending to a set of same host devices, wherein each subtree comprises at least one intermediate stage and wherein an intermediate stage tree element of one tree is not directly connected to an intermediate stage tree element of another tree at the same stage (Saleh: see Figure 1, Primary Path VP0 and Secondary Path VP0; see also "In a 1 + 1 restoration method, two distinct physical paths…in case of a failure" in column 3, lines 64 through column 4, line 32; for each virtual path (VP0), two disjoint physical paths, a primary and a secondary, are setup. Each intermediate or tandem node in the primary and secondary physical path has only one link connected to another node going toward the destination (up-link direction) and one link to another node toward the source (down-link direction));

at least one apparatus comprising a controller (Saleh: see "the present invention…standby physical path" in column 2, line 15 – 23) *configured*

to monitor the state of a critical up-link, the critical up-link being an only link from the intermediate tree element to an upper stage tree element in the tree structure (Saleh: see Figure 1, Primary Path VP0 and Secondary Path VP0; see also "In a 1 + 1 restoration method, two distinct physical paths…in case of a failure" in column 3, lines 64 through column 4, line 32; see also see "When the VP's active physical path fails at a tandem node…to reflect the physical path change of the VP" in column 4, lines 47 through column 5, line 9; see also Figure 4 and "FIG. 4 is a flowchart illustrating the

actions…VP at the tandem nodes are not released" in column 5, lines 42 - 61; for each virtual path (VP0), two disjoint physical paths, a primary and a secondary, are setup. Each intermediate or tandem node in the primary and secondary physical path has only one link connected to another node going toward the destination (up-link direction) and one link to another node toward the source (down-link direction). When the VP's active physical path fails at an intermediate node, the tandem node detects it and initiates a path restoration request for the end nodes. In addition, when an intermediate node receives a notification of a VP failure, it forwards the failure notification along the path towards the end nodes. When an end node receives a path failure message or a Restore_I request, the end node switches the VP to the standby path)*;*

to detect a link-down state in the critical up-link (Saleh: see "When the VP's active physical path fails at a tandem node, the tandem node initiates a path restoration request for the end nodes (the source node and the destination node) of the failed VP using a Restore_I request" in column 4, lines 47 – 50; when the VP's active physical path fails at an intermediate node, the intermediate node detects the failure and initiates a path restoration request for the end nodes)*, and*

to set a dependent down-link in a link-down state, if said critical up- link is detected to be in the link-down state, the dependent down-link leading to a lower stage tree element in the tree structure and being an only link from the intermediate tree element to the lower stage tree element in the tree structure (Saleh: see Figure 1, Primary Path VP0 and Secondary Path VP0; see also "When the VP's active physical path fails at a tandem node, the tandem node initiates a path restoration request for the

end nodes (the source node and the destination node) of the failed VP using a Restore_I request" in column 4, lines 47 – 50; see also Figure 4 and "FIG. 4 is a flowchart illustrating the actions…VP at the tandem nodes are not released" in column 5, lines 42 - 61; for each virtual path (VP0), two disjoint physical paths, a primary and a secondary, are setup. Each intermediate or tandem node in the primary and secondary physical path has only one link connected to another node going toward the destination (up-link direction) and one link to another node toward the source (down-link direction). When the VP's active physical path fails at an intermediate node, the intermediate node detects the failure and initiates a path restoration request for the end nodes. In addition, when an intermediate node receives a notification of a VP failure, it forwards the failure notification along the path towards the end node)*; and*

at least one host device comprising a controller (Saleh: see "the present invention…standby physical path" in column 2, line 15 – 23) *configured*

to monitor the state of an active up-link in a host device leading to an intermediate tree element in a first tree (Saleh: see Figure 1, Primary Path VP0 and Secondary Path VP0; see also "In a 1 + 1 restoration method, two distinct physical paths…in case of a failure" in column 3, lines 64 through column 4, line 32; see also "When the VP's active physical path fails at a tandem node…to reflect the physical path change of the VP" in column 4, lines 47 through column 5, line 9; see also Figure 4 and "FIG. 4 is a flowchart illustrating the actions…VP at the tandem nodes are not released" in column 5, lines 42 - 61; for each virtual path (VP0), two disjoint physical paths, a primary and a secondary, are setup. Each intermediate or tandem node in the primary

and secondary physical path has only one link connected to another node going toward the destination (up-link direction) and one link to another node toward the source (down-link direction). When the VP's active physical path fails at an intermediate node, the intermediate node detects the failure and initiates a path restoration request for the end nodes. In addition, when an intermediate node receives a notification of a VP failure, it forwards the failure notification along the path towards the end nodes. When an end node receives a path failure message or a Restore_I request, the end node switches the VP to the standby path),

to detect a link-down state in the active up-link (Saleh: see "When the VP's active physical path fails at a tandem node…to reflect the physical path change of the VP" in column 4, lines 47 through column 5, line 9; see also Figure 4 and "FIG. 4 is a flowchart illustrating the actions…VP at the tandem nodes are not released" in column 5, lines 42 - 61; when the VP's active physical path fails at an intermediate node, the intermediate node detects it and initiates a path restoration request for the end (source and destination) nodes. In addition, when an intermediate node receives a notification of a VP failure, it forwards the failure notification along the path towards the end nodes. When an end node receives a path failure message or a Restore_I request, the end node switches the VP to the standby path),

to notify host software about the link-down state (Saleh: see "When the VP's active physical path fails at a tandem node…to reflect the physical path change of the VP" in column 4, lines 47 through column 5, line 9; see also Figure 4 and "FIG. 4 is a flowchart illustrating the actions…VP at the tandem nodes are not released" in column

5, lines 42 - 61; when the VP's active physical path fails at an intermediate node, the tandem node detects it and initiates a path restoration request for the end nodes. In addition, when an intermediate node receives a notification of a VP failure, it forwards the failure notification along the path towards the end nodes. When an end node receives a path failure message or a Restore_I request, the end node switch the VP to the standby path), and

to start a recovery process by changing tile failed active up-link to a redundant up-link leading to an upper stage intermediate tree element in a second tree (Saleh: see "When the VP's active physical path fails at a tandem node…to reflect the physical path change of the VP" in column 4, lines 47 through column 5, line 9; see also Figure 4 and "FIG. 4 is a flowchart illustrating the actions…VP at the tandem nodes are not released" in column 5, lines 42 - 61; for each virtual path (VP0), two disjoint physical paths, a primary and a secondary, are setup. Each intermediate or tandem node in the primary and secondary physical path has only one link connected to another node going toward the destination (up-link direction) and one link to another node toward the source (down-link direction). When the VP's active physical path fails at an intermediate node, the tandem node detects it and initiates a path restoration request for the end nodes. In addition, when an intermediate node receives a notification of a VP failure, it forwards the failure notification along the path towards the end nodes. When an end node receives a path failure message or a Restore_I request, the end node switches the VP to the standby path).

Regarding claim 19, *further comprising monitoring the state of a critical up-link by monitoring the quality of the data flow on the link* (Saleh: see “In case of a VP failure at any node in the network…to restore the failed VP”).

Regarding claim 20, *wherein the controller is further configured to:*

check the status of a redundant up-link link (Saleh: see Figure 4 and “If the failure notification is received by the end node…the previous physical path is restored” in column 5, line 62 through column 6, line 21), *and*

if said up-link is in the link down state, and transfer said host to a predetermined default mode operation link (Saleh: see Figure 4 and “If the failure notification is received by the end node…the previous physical path is restored” in column 5, line 62 through column 6, line 21).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Saleh et al. (US 7,200,104 B2) in view of Lamport et al. (5,138,615).

Saleh discloses all the limitations as in paragraph 2 above. Saleh does not explicitly disclose the feature: regarding claim 13, *wherein said monitoring is performed with an Ethernet controller.*

Lamport discloses a mesh connected local area network provides automatic packet switching and routing between host computes comprising:

Regarding claim 13, wherein said monitoring is performed with an Ethernet controller (Lamport: column 8, lines 57 – 61; the switches and hosts monitor the states of links in the Ethernet network).

it would have been obvious to one of ordinary skill in the art at the time of the invention to apply the failure handling technique disclosed by Lamport into the method of Saleh. The motivation would have been in providing a faster fault detection and recovery procedure.

Response to Arguments

5. Applicant's arguments with respect to claims 1 - 20 have been considered but are moot in view of the new ground(s) of rejection.

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JUVENA LOO whose telephone number is (571)270-1974. The examiner can normally be reached on Monday - Friday: 7:30am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kwang Yao can be reached on (571) 272-3182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JUVENA LOO/
Examiner
Art Unit 2616
May 26, 2008

/Kwang B. Yao/

Supervisory Patent Examiner, Art Unit 2616